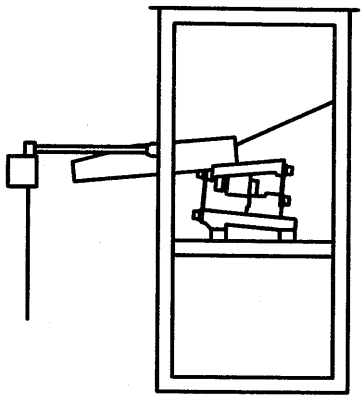
No.PMPH006E-b

NTN

Read the Instruction Manual to the last before use, and operate the machine correctly.

INSTRUCTION MANUAL



NTN
Separately Placed Hopper
Type
V72/V01/V03/V04/V06/V08/V12

Introduction

Thank you for your purchase of the NTN Separately Placed Hopper.
For correct operation of the NTN Separately Placed Hopper, read the Instruction Manual carefully before use, and ensure execution of safe work through correct operation.
Be sure to deliver this Instruction Manual to the end user. The end user is further requested to store the Instruction Manual carefully in a ready-to-take out place to facilitate ready reference at any time after reading.

1. Before Use

- ☐ **Upon receipt of the product, check it for damage caused during transportation and also missing of parts. If a problem should be found, get in touch with your local distributor immediately.**
- ☐ **Be sure to remove the packing of the machine before use.**
- ☐ **Be sure to use NTN controller for this machine.**
  If other controllers are used, specified performances of the machine may not be exhibited.

Contents

2. Precaution for Safety

This machine is designed and manufactured with the concept of trouble-freeness and labor saving as parts supply equipment. However, so far as safety is concerned, much of responsibility is fixed upon yourself as a user. Be sure to read this Instruction Manual carefully before starting use of the machine, and also be sure to strictly observe the safety precautions. Further, strictly observe the warning and caution labels attached to the main body.

WARNING	Indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury.
CAUTION	Indicates a potentially hazardous situation which, if not avoided, will result in minor or moderate injury or property damage only.

WARNING	
	The most hazardous points of the machine lie in electric equipment. Be sure to connect a grounding cable. Electric shock may be caused, unless the machine is grounded.
	Do not use the machine under environment where explosive gas or flammable gas exists or leaks. Explosion or fire hazard may be caused.
CAUTION	
	Do not use the machine in a place exposed to splash of water, outdoors, or in a place of extremely low temperature or high temperature and high humidity. (See the next page for operating environmental conditions.)
	• This machine is a heavy material. (See the specification in Section 10 for the mass.) In transporting the machine, wear safety shoes, watch out for dropping, and take due care. • Fix the machine securely after installation.
	Do not touch the product with naked hands during the installation or assembly work. Be sure to wear gloves.
	Do not use the machine on a base lacking in sufficient strength or in an unstable place. The specified performance of the machine may not be ensured.
	Do not place the body in inclination. The specified performance of the machine may not be ensured.
	Please do not scratch, pull or forcibly bend the wiring. Moreover, when a heavy thing is put on it, or it is pinched, the wiring will damage. It causes a fire or an electric shock.

☐ **For correct operation of the machine**

① NTN separately placed hopper is a vibrating machine to store specified parts in bulk state temporarily and supply them to parts alignment equipment such as bowl feeder. Do not use the hopper as equipment for purposes other than above such as material test equipment and sieve.

② Use the NTN separately placed hopper in conformance to instructions in this operation manual. See the specification in item 10 for technical specification.

③ Be sure to use NTN controller of this machine. Also, use a controller and power supply compatible with this machine.

④ Generated noise level depends on the specification of this machine, material of parts to be fed, etc. When noise level is above acceptable limit, take a noise insulation measure with noise insulation cover, etc.

(Note 1) When the machine is not complete (such as unusual noise, abnormal vibration and damaged parts), do not use the machine.

(Note 2) Operating environmental conditions

Operating ambient temperature	0 to 40°C
Operating ambient humidity	30 to 90% (However, no dew condensation is allowed.)
Operating altitude	2,000 m max.
Storage temperature during transportation	-10 to 50°C
Ambience of operating place	No splashing of water or chemicals is allowed. Combustible gas or corrosive gas shall not be located nearby. The machine shall be used indoors.

☐ **User strict observance items**

① Be sure to conduct any work such as run, maintenance and repair in strict conformance to this Instruction Manual and instructions given in the manual.

② Avoid use of NTN separately placed hopper in such a matter as to spoil safety of the machine. If any sign of change possibly leading to spoilage of the machine safety, inform **NTN** immediately.

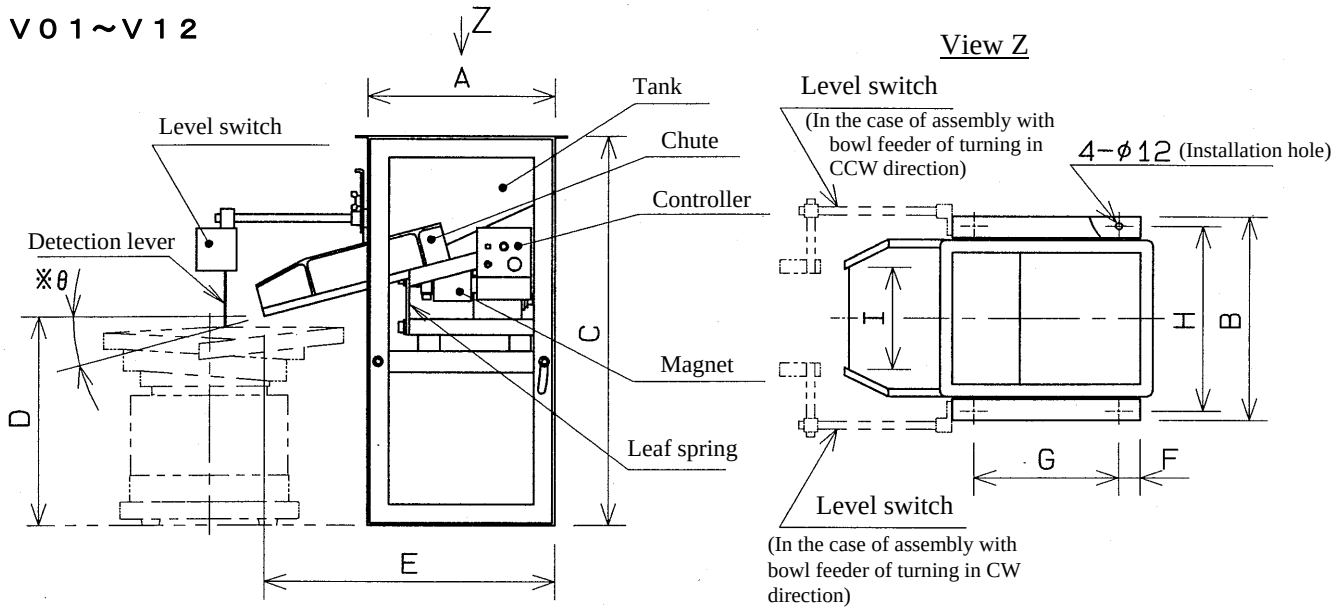
(Note) NTN separately placed hopper should be operated, maintained and repaired by professional engineers. Operations of the machine by persons other than authorized personnel should be avoided.

3. Operating Principles

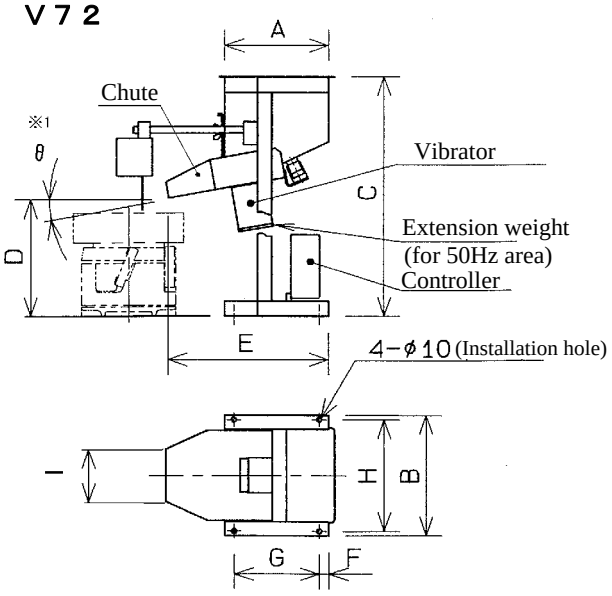
- NTN separately placed hopper mainly consists of a tank to store works (specified parts), chute set in the lower area of the tank, rubber vibration insulators and support members to support them.
- Works charged in the tank are received by the chute. When the magnet is turned ON, the chute vibrates to discharge the works. Discharge of works is controlled with the work volume in the bowl feeder bowl detected by the level switch. The magnet is turned ON-OFF by the controller.

4. Names and Dimensions of Main Component Parts

V01～V12



V72



Part No.	Dimensions (mm)								
	A	B	C	D※2	E※3	F	G	H	I
K-V7S2$\frac{3}{4}$	220	260	514	286	333	20	180	240	100
K-V01S$\frac{3}{4}$	350	385	735	435	542	40	270	350	185
K-V03S$\frac{3}{4}$	400	435	735	418	570	50	300	400	225
K-V03S1$\frac{3}{4}$	400	435	735	417	670	50	300	400	225
K-V04S$\frac{3}{4}$	400	435	860	418	570	50	300	400	225
K-V04S1$\frac{3}{4}$	400	435	860	417	670	50	300	400	225
K-V06S$\frac{3}{4}$	500	505	1017	574	721	50	400	470	270
K-V06S1$\frac{3}{4}$	500	505	1017	574	771	50	400	470	270
K-V08S$\frac{3}{4}$	500	505	1127	574	721	50	400	470	270
K-V08S1$\frac{3}{4}$	500	505	1127	574	771	50	400	470	270
K-V12S4	640	635	1186	596	852	70	500	590	380

※1 The chute inclination angle θ can be adjusted within the ranges of 0º to 10º (V72, V03, V04, V06, V08) and 5º to 15º (V01, V12).

※2 Dimension D is a value applicable when the chute is set to the inclination angle closes to horizontality.

※3 Dimension E varies with adjustment of the angle of the chute. Dimensions in the table are minimum values.

(Note) In the case of special specifications, the figure may be different from that shown above.

5. Relocation

> **⚠ CAUTION**
>
> **This machine is heavy. Relocate the machine with care not to drop it.**
> **Note carefully that serious accident may result when the machine is dropped.**

☐ Precautions for relocation

(1) Use the lifting device and hoisting accessory of capacity sufficient for lifting each main body weight. Refer to item 10 Specification for the mass of the body.

(2) When lifting the machine, pass hoisting accessory such as nylon slingers (at least 2 pieces) through the right and left frame top ends, and relocate the machine carefully while taking care of the balance of the main body. Further, the tank unit may be deformed. Be fully careful not to apply strong impact to the tank during relocation. Take protective measures such as setting of batten by need.

(3) When relocating the machine, be sure to wear protective gloves. In addition, take measures with cushioning materials, tapes and others to prevent contact of the human body with sharp edges or protrusions of individual sections of the machine.

(4) When relocating the machine, do not allow unauthorized persons to come close to the machine. Further, take appropriate measures to protect persons located in vicinity.

6. Installation and Assembly

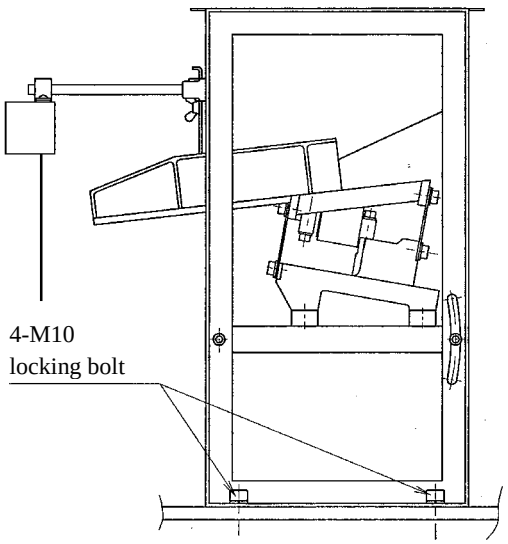
> **⚠ CAUTION**
>
> - **Do not install and assemble the machine on a table of insufficient strength or at an unstable place.**
> - **In installation and assembly of the machine, tighten the locking bolts securely.**
> - **Be sure to wear protective gloves.**

(1) In installation of the machine, fix the machine securely with M10 locking bolts(in the case of V72, it is M8), using ϕ12(in the case of V72, it is ϕ10) base hole in 4 places located under the hopper as shown.

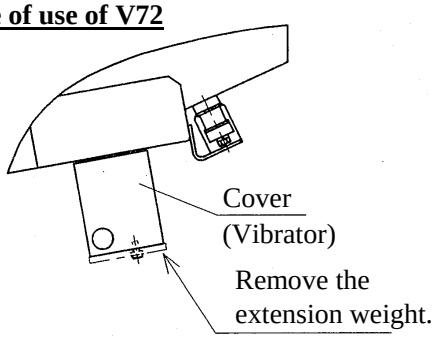
※ For the installation hole pitch, see “4. Names and Dimensions of Main Component Parts”.

(2) Take preventive measures not to suffer from injury due to sharp edges and protrusions of individual sections during the work.

(3) In the case of use of V72 in 60Hz range, remove the extension weight of the vibrator (Cf. chart below).



In the case of use of V72



60Hz range

7. Wiring and Running Methods

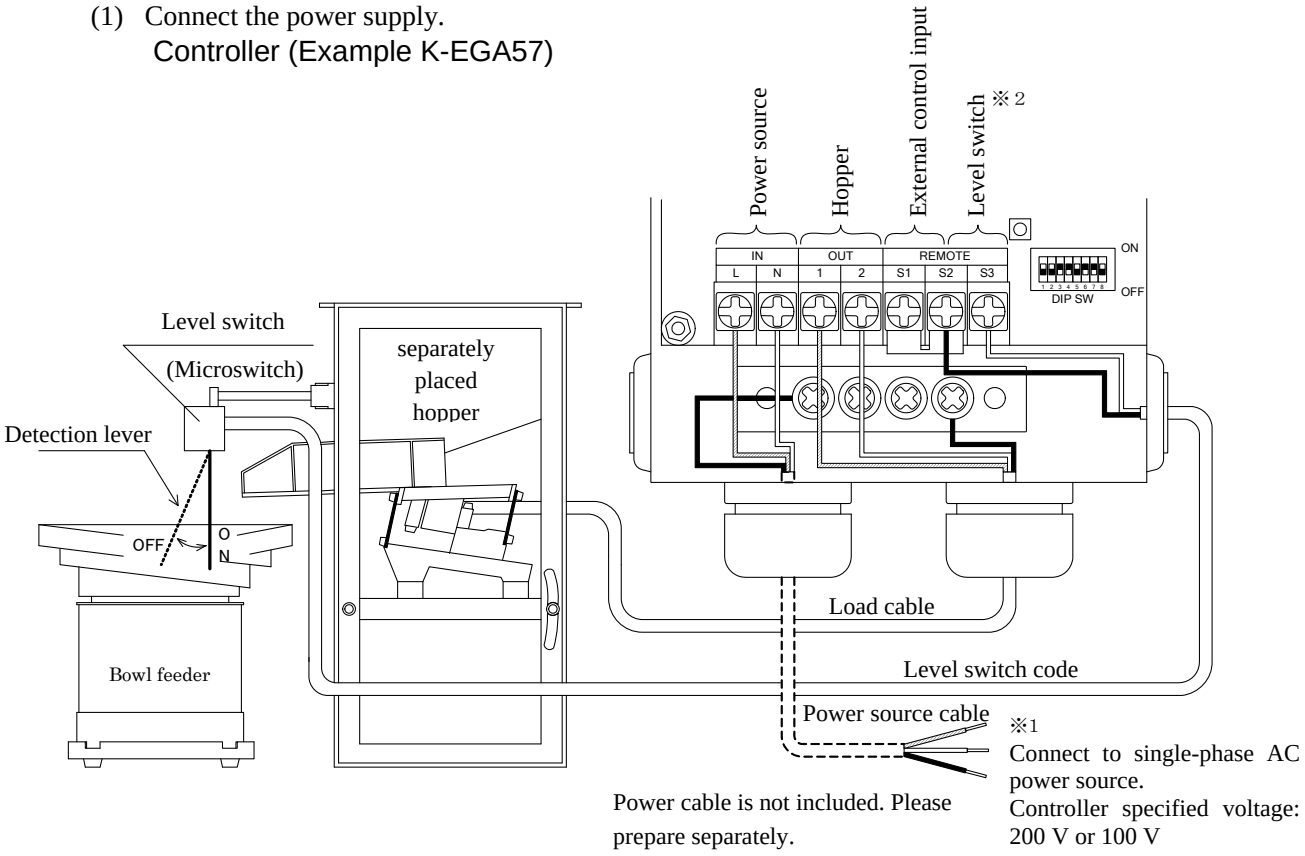
WARNING

Ensure the supply voltage as specified on the machine nameplate (Seal bearing the type No., power requirements and manufacturer's serial No.) attached to the vibrator main body.
Be sure to connect the grounding cable to the machine.

Caution

When setting the controller equipped with changeover switch (full wave/half wave, 50Hz/60Hz, 100V/200V, etc) and the variable frequency controller provided with F-V curve setting, make it conform to the specification and power condition of the main body. Wrong setting may result in accident such as burning of magnet. See the operation manual of the controller for the changeover switch and setting of F-V curve, etc.

(1) Connect the power supply.
Controller (Example K-EGA57)



Power cable is not included. Please prepare separately.

※1
Connect to single-phase AC power source.
Controller specified voltage: 200 V or 100 V

※1 In the case of three-phase power supply, use any two phases out of three. Do not use the balance one phase.
※2 In case of not using the level switch, please short circuit between S2-S3 terminals of the controller, with short circuit clamp etc.

(Note 1) When the machine is incorporated to some apparatus, do not open or close the primary side of the controller but use external control input terminal in turning on and off.

(Note 2) Power connecting work must be performed by personnel in charge of electric engineering. When modifying or changing connection, see the operation manual of controller.

(Note 3) When it is intended to combine the separately placed hopper with the NTN bowl feeder, ensure an electric circuit so that the separately placed hopper also stops when the bowl feeder and others stop. For details, refer to the Controller Instruction Manuals.

(Note 4) The supplied level switch

① The supplied level switch is a hopper discharge control equipment to detect the work volume level in the bowl feeder bowl and others to keep the work volume constant. With a microswitch built in, the level switch is so designed that the contact closes (ON) when the detection lever is in the right downward direction (no works) and opens (OFF) when the detection lever comes afloat as a result of detection works. To quantity of the work to spend, please use it as Hopper driving control (ON-OFF) equipment by adjusting the height of the level switch detection lever.

② Structurally, the level switch does not function when the bowl feeder is in stop. Incorporate an appropriate interlock circuit so that the hopper may not run during shutdown of the bowl feeder.

③ Use the detection lever after adjusting its setting position in the horizontal and height directions as needed for detection of specified parts.

(2) Charge works in the tank. (Strictly observe instruction of an appropriate work storage quantity specified by NTN, if any.)

(3) Turn the controller speed control volume CCW to adjust the volume to the scale “0”. (Make sure that the separately placed hopper is free and in no contact with something around.)

(4) Turn ON the POWER switch of the controller. (Make sure of lighting of the POWER lamp.)

(5) Slowly turn the speed control volume CW to adjust the volume to the position of an necessary discharge quantity. Operate this machine under the maximum acceptable amplitude of leaf spring in the item 8 in order to prevent breakage of leaf spring. (Indication mark is found around the controller speed adjusting knob, set the adjusting knob at corresponding position in use.)

(6) Operate the detection lever to check that separately placed hopper is turned ON-OFF.

(Note) To stop discharge of products from the separately placed hopper temporarily or settle the problem of troublesome operation of the hopper during adjustment, bring up the detection lever, and pass pin of f4 max. through the run-through hole in the cover to lock the lever.

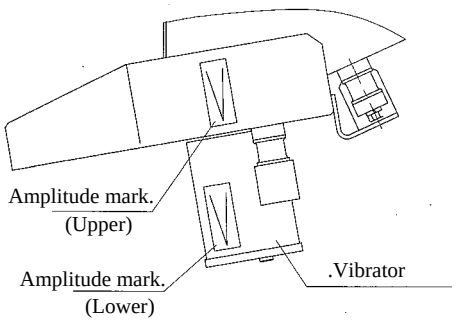
8. Inspection and Adjustment

(1) Acceptable maximum amplitude of leaf spring

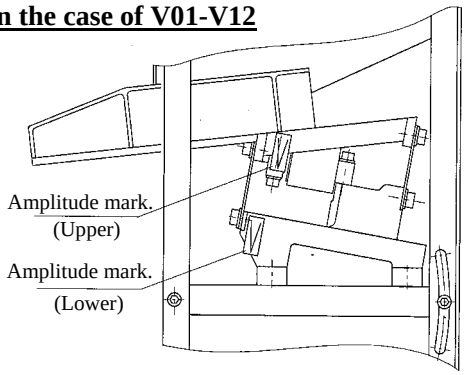
Operate the machine with the amplitude below that shown in the following table in order to prevent breakage of leaf spring. If the machine is used with greater amplitude, the leaf spring may be broken earlier. When measuring the amplitude, affix the attached amplitude mark as shown below, and be sure to sum up the reading of upper and lower amplitude mark.

Model/Size	Plate spring product number	Amplitude(mm) (Upper + Lower)
V72	K-PLS4-70×9	1.4
V01	K-PLS2-86×15 K-PLS4-85×16	1.0
V03, V3・1 V04, V4・1	K-PLS4-85×16	1.1
V06, V6・1 V08, V8・1	K-PLS4-85×16-1	1.1
V12	K-PLS4-125×30	1.7

In the case of V72



In the case of V01-V12

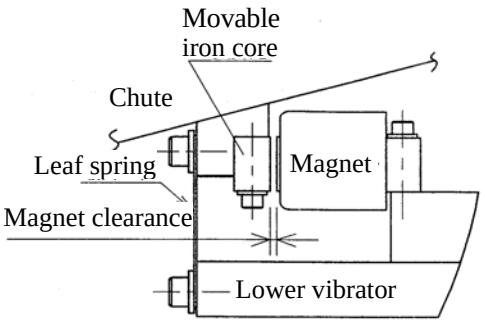


(2) Check and adjustment of clearance in magnet

Clearance between the magnet and moving iron core is set to those described in the table below in shipment of the machine from NTN. It is recommended to make is as small as possible to the extent where they are not in contact in the maximum amplitude, therefore check it from time to time and maintain an appropriate value.

In addition, check periodically that no foreign matter such as dirt and iron powder is included.

Main body	Magnet clearance(mm)	
	In shipment	Maximum
V72	1.0	
V01～V12	2.0	



<Adjusting procedure>

① Remove the cover. (Allowed only on V72)

② Insert a clearance gauge of the specified dimensions for each body (shown in the above table) into the magnet clearance, push the movable iron core toward the magnet side, and temporarily tighten the movable iron core locking bolt.

③ Tighten the movable iron core locking bolt. At that time, take care so that the movable iron core position set in the Step ② may not deviate.

④ Pull out the clearance gauge. Check the parallelism to and clearance in the magnet. Check that no deviation is present in the clearance between the magnet and the movable iron core.

⑤ Fit the cover. (Allowed only on V72)

Note 1) When the machine is used with the magnet clearance increased by 120% min. of the maximum value shown in the table, the magnet may burn. Check the magnet clearance from time to time to keep a proper value.

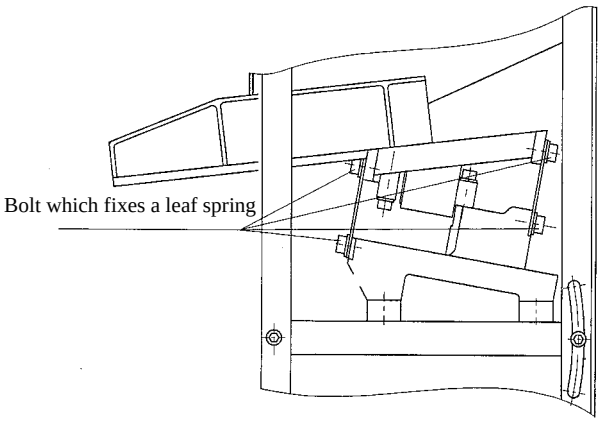
Note 2) When the machine is operated in much dusty atmosphere, such dusts and powders may stick to the magnet to narrow the clearance, possibly leading to generation of unusual noise. Conduct periodic check to remove such deposits.

Note 3) No clearance gauge is attached. Purchase a commercial thickness gauge.

(3) Bolt tightening check

① The bolt which fixes a leaf spring (please refer to a right figure for V01 - V12. There is V72 in a vibrator) are tightened by us sufficiently before shipping. But, to prevent a possible trouble due to loosening of them, periodically check that they are not loosened. In addition, please use things more than strength classification 10.9 when I change a bolt. (Leaf spring clamping torque and the strength classification refer to specifications of Clause 10.)

② By vibration such as the part injection, a tank fixation volt might be loosened. Same as described above, periodically check that the tank fixation bolts are tightened securely, and please change it as needed.



9. Troubleshooting

If a machine trouble should take place, check the following points.

(1) No vibration at all

①Improper connection of power supply (See the "Wiring and Running Methods" in Section 7.)
②Fusion of controller fuse
③Disconnection of magnet coil
④Wrong operation or break of microswitch

(2) Vibration available but amplitude insufficient

①Improper power supply (such as connection of 100 V in spite of 200 V specifications)
②Loosening of leaf spring fixation bolt
(For leaf spring fixation torque, see the specification table to item 10.)
③Loosening of fixation bolts of frame and others
④Excessively large work charge mass

(3) Unavailability of control of vibrations

①Controller in trouble

(4) Unusual metallic noise

①Excessively narrow magnet clearance or inclusion of foreign matter
③Excessive amplitude
③Loosening of clamping bolts of the tank and the vibrating unit

When you inform NTN of trouble condition with unknown cause, let them know the detail as far as possible with reference to the above so that they can take a measure as soon as possible.

10. Specifications

K – V 03 S 1 4

- 4 — Voltage/drive system (3 : 100V Half wave、4 : 200V Half wave)
- 1 — Design change code
- S — Tank material (S: Stainless steel)
- 03 — Storage quantity
- V — Body type

Product number	K-V7S2$^{3}_{4}$	K-V01S$^{3}_{4}$	K-V03S$^{3}_{4}$ K-V03S1$^{3}_{4}$	K-V04S$^{3}_{4}$ K-V04S1$^{3}_{4}$
Tank capacity (L)	7	15	30	45
Supply voltage (V)	Part No. last digit 3: 100 Part No. last digit 4: 200			
Current consumption (A)	Part No. last digit 3 : 0.4 Part No. last digit 4 : 0.2	Part No. last digit 3 : 3.2 Part No. last digit 4 : 1.0		
Power consumption (VA)	40	Part No. last digit 3 : 320 Part No. last digit 4 : 200		
Drive system	Half wave			
Frequency (times/min)	3000(50Hz)、3600(60Hz)			
Chute inclination angle (º)	0～10	5～15	0～10	
Work max. charge mass (kg)	20	50	100	
Magnet Part No. (No. of magnets used)	Part No. last digit 3 (for 100 V): K-PMG-111-1 (1 piece) Part No. last digit 4 (for 200 V): K-PMG-121-1 (1 piece)	Part No. last digit 3 (for 100 V): K-PMG-311-1 (1 piece) Part No. last digit 4 (for 200 V): K-PMG-321 (1 piece)		
Cable size × length (from center)	1mm²×1.1m	1mm²×1.1m		
Leaf spring part No. and quantity as standard set (Material: Steel)	K-PLS4-70×9 2 pieces	K-PLS2-86×15 2 pieces K-PLS4-85×16 1 piece	K-PLS4-85×16 2 pieces	
Leaf spring dim. (mm) Length (hole pitch) × Width × Thickness	88×50×0.9	106×35×1.5 115×150×1.6	115×150×1.6	
Leaf spring locking bolt strength division	12.9			
Leaf spring tightening torque	68.6N・m (700kgf・cm)	117.6N・m (1200kgf・cm)		
Main outside colors	Frame: Black Tank and chute: SUS material color	Frame: Black Tank: SUS material color Chute: Aluminum material color		
Mass (kg)	12	55	K-V03S$^{3}_{4}$: 65 K-V03S1$^{3}_{4}$: 70	K-V04S$^{3}_{4}$: 68 K-V04S1$^{3}_{4}$: 73

(Note) For controllers that can apply to this machine, refer to the Catalog and the Controller Instruction Manual.

Product number	K-V06S3 4 K-V06S1 3 4	K-V08S3 4 K-V08S1 3 4	K-V12S4
Tank capacity (L)	60	80	120
Supply voltage (V)	Part No. last digit 3: 100 Part No. last digit 4: 200		200
Current consumption (A)	Part No. last digit 3 : 3.2 Part No. last digit 4 : 1.0		2.0
Power consumption (VA)	Part No. last digit 3 : 320 Part No. last digit 4 : 200		400
Drive system	Half wave		
Frequency (times/min)	3000(50Hz)、3600(60Hz)		
Chute inclination angle (º)	0～10		5～15
Work max. charge mass (kg)	120		
Magnet Part No. (No. of magnets used)	Part No. last digit 3 (for 100 V): K-PMG-3111-1 (1 piece) Part No. last digit 4 (for 200 V): K-PMG-321 (1 piece)		K-PMG-321 (2 pieces)
Cable size × length (from center)	1mm²×1.1m		1mm²×1.1m (2 pieces)
Leaf spring part No. and quantity as standard set (Material: Steel)	K-PLS4-85×16-1 2 pieces		K-PLS4-125×30 2 pieces
Leaf spring dim. (mm) Length (hole pitch) × Width × Thickness	115×270×1.6		155×360×3
Leaf spring locking bolt strength division	12.9		
Leaf spring tightening torque	117.6N・m (1200ｋｇｆ・ｃｍ)		
Main outside colors	Frame: Black Tank: SUS material color Chute: Aluminum material color		
Mass (kg)	K-V06S3 4 : 80 K-V06S1 3 4 : 85	K-V08S3 4 : 84 K-V08S1 3 4 : 90	200

(Note) For controllers that can apply to this machine, refer to the Catalog and the Controller Instruction Manual.

[MEMO]

About NTN Parts Feeder Shipping Warranty Card

A shipping warranty card is attached to this product. Be sure to receive the card at the occasion of your purchase of the product.
The warranty card assures free repair of the product in accordance with conditions specified in the card. You are requested to keep the card after reading the descriptions given therein carefully.

・The Instruction Manual is subject to change without prior notice for functional improvement or other purposes.

Published: Dec. 3, 2012　7th edition

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